

***Porosynnema catenatum* gen. & sp. nov. from Yunnan, China**

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ABSTRACT—A new genus and species, *Porosynnema catenatum*, collected on decaying twigs of an unidentified broadleaf tree in Xishuangbanna, China, are described and illustrated. The genus is characterized by macronematous, unbranched conidiophores forming distinct, indeterminate synnematal conidiomata with polytretic, integrated, terminal, cylindrical, cicatrized, determinate or percurrently extending conidiogenous cells that produce acropleurogenous, catenate, obclavate, distoseptate conidia with a thick, dark hilum at the base. A key to *Porosynnema* and its morphologically similar genera is provided.

KEY WORDS—asexual Ascomycota, taxonomy, tropical forest

Introduction

Xishuangbanna Dai Autonomous Prefecture is located in the southwestern part of Yunnan Province, lying on the northern edge of the tropical region south of the Tropic of Cancer. It covers 19,125 km² and has a tropical monsoon climate with high humidity, high mean temperature, and an annual precipitation of 1200–1800 mm, so it is particularly suitable for the growth of microscopic fungi in plant remains. During our continuous survey of anamorphic fungi in this region, an interesting fungus was collected that is significantly different

from all previously described hyphomycetes (Seifert & al. 2011). Therefore, it is described here as a new genus and species.

Materials & methods

Samples of dead branches were collected from humid environments and river bank in the forest ecosystems of Xishuangbanna, Yunnan Province, China, and placed in ZiplocTM bags for transport to the laboratory, where they were processed, and examined as described by Ma & al. (2011). Fungi were mounted in a drop of lactic acid on microscope slides and examined and photographed using an Olympus microscope (model BX 53) with a 100× (oil immersion) objective at the same background and scale. Adobe Photoshop 7.0 was used for image processing to assemble photographic plates. Single-spore isolations were unsuccessful on potato dextrose agar (PDA) after several attempts. The specimens are deposited in the Herbarium of Jiangxi Agricultural University, Plant Pathology, Nanchang, Jiangxi, China (HJAUP).

Taxonomy

Porosynnema Jing W. Liu, X.G. Zhang, R.F. Castañeda & Jian Ma, **gen. nov.**

IF 559619

Differs from *Dendrographium* by its cicatrized conidiogenous cells, and catenate conidia.

TYPE SPECIES: *Porosynnema catenatum* Jing W. Liu & al.

ETYMOLOGY: *poro-* (Latin) meaning pore + *-synnema* (Latin) referring to the type of conidiomata of this fungus.

CONIDIOMATA synnematous, solitary, erect, cylindrical, indeterminate, melanocratic. CONIDIOPHORES synnematous, macronematous, unbranched, septate, melanocratic. CONIDIOGENOUS CELLS diverging from the synnematal axis, polytretic, terminal, integrated, cylindrical, cicatrized, determinate or with percurrent extensions. Conidial secession schizolytic. CONIDIA acropleurogenous, blastocatenate, obclavate, distoseptate, generally with a thick, dark hilum at the base.

Porosynnema catenatum Jing W. Liu, X.G. Zhang, R.F. Castañeda & Jian Ma,

sp. nov.

FIGS 1, 2

IF 559620

Differs from *Dendrographium* spp. by its cicatrized conidiogenous cells, and catenate conidia.

TYPE: China, Yunnan Province: Xishuangbanna Dai Autonomous Prefecture, the Nabanhe National Nature Reserve, on dead branches of an unidentified broadleaf tree,

12 July 2021, J.W. Liu (**Holotype**, HJAUP M2152).

ETYMOLOGY: Latin, *catenatum*, referring to the chained conidia.



FIG. 1. *Porosynnema catenatum* (holotype, HJAUP M2152). A–C. Synnemata with conidiophores, conidiogenous cells, and conidia; D. Conidia.

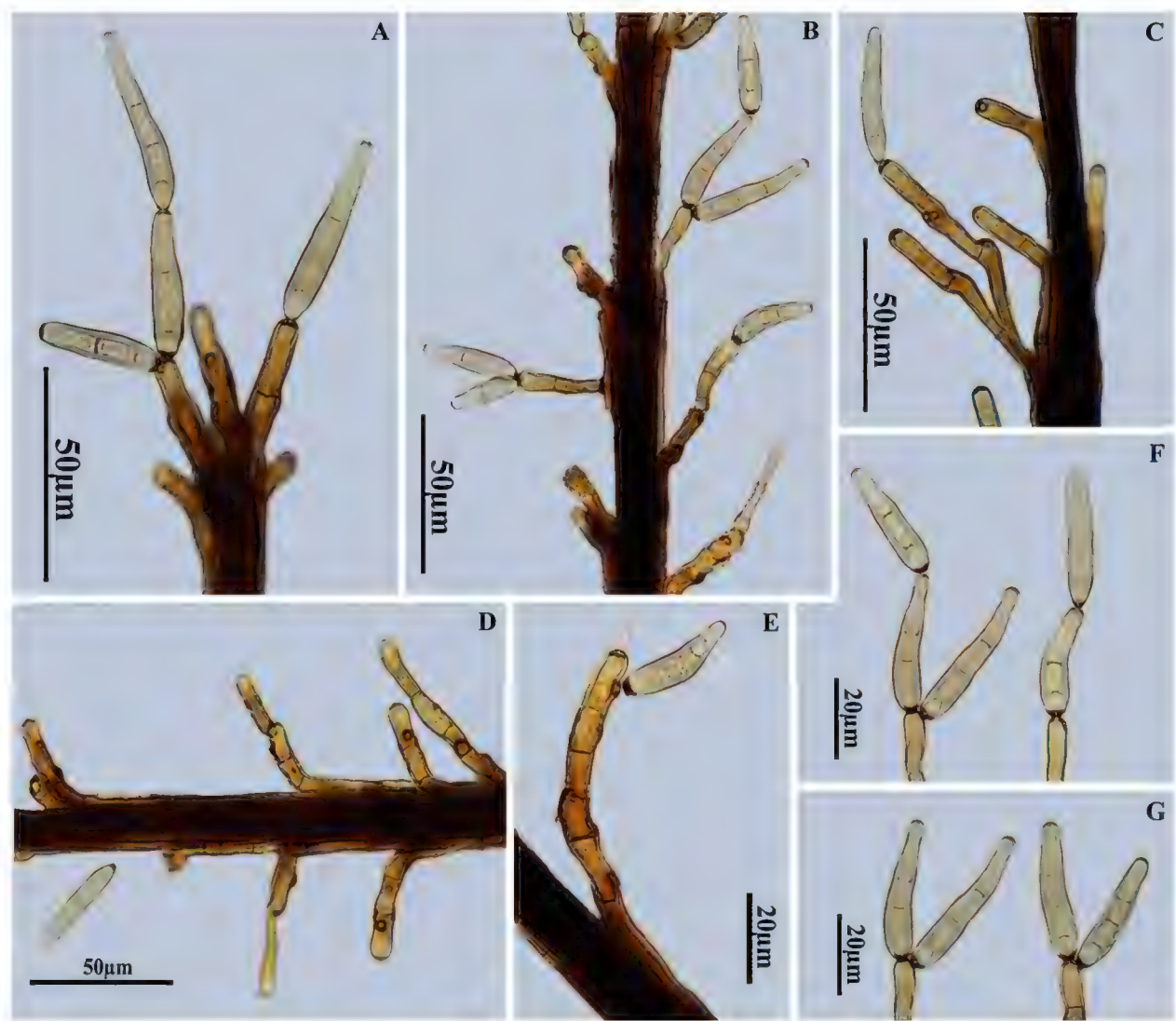


FIG. 2. *Porosynnema catenatum* (holotype, HJAUP M2152). A–E. Conidiophore section, conidiogenous cells, and conidia; F, G. Conidiogenous cells, and conidia.

COLONIES effuse on the natural substratum, dark brown to black, hairy. Mycelium superficial and immersed. CONIDIOMATA synnematos, solitary, erect, cylindrical, dark brown to black, indeterminate, up to 1.9 mm high, 21–54 µm diam., with lateral and terminal divergent conidiophores. CONIDIOPHORES macronematous, unbranched, with filaments cylindrical, compactly packed, slightly bent at the apex, laterally and apically divergent on the stipe, septate, dark brown to brown, smooth-walled, up to 1.9 mm long, 3–6 µm wide. CONIDIOGENOUS CELLS polytretic, integrated, terminal, cylindrical, cicatrized, smooth, brown to pale brown, determinate or with 1–2 cylindrical percurrent extensions, 14–29 × 4–6 µm. Conidial secession schizolytic. CONIDIA acropleurogenous, blastocatenate, obclavate, straight or slightly curved, 2–5-distoseptate, smooth-walled, grey-brown, paler toward the

apex, $28\text{--}94 \times 6\text{--}8 \mu\text{m}$, tapered towards the apex, base truncate, $2\text{--}4 \mu\text{m}$ wide, with a thick, dark hilum at the base.

Discussion

Porosynnema is distinguished by its unbranched conidiophores forming synnematus conidiomata, and solitary, acropleurogenous, catenate, obclavate, distoseptate conidia seceding schizolytically from polytretic, terminal, integrated, determinate or percurrently extending conidiogenous cells diverging from the axis of the synnemata. It appears like several genera including *Podosporium* Schwein., *Dendrographium* Masee, *Vamsapriya* Gawas & Bhat, and *Podosporiopsis* Jian Ma & al. in possessing distinct conidiophores forming synnematus conidiomata (Schweinitz 1832, Masee 1892, Gawas & Bhat 2005, Ma & al. 2016). However, in *Vamsapriya*, *Podosporium* and *Podosporiopsis* conidiogenesis is monotretic, in contrast to the polytretic conidiogenesis of *Porosynnema*. In addition, *Vamsapriya* and *Podosporium* have euseptate conidia far different from the distoseptate conidia of *Porosynnema*. The conidiogenous events in *Dendrographium* and *Porosynnema* are the same, but in *Dendrographium* the synnemata are determinate and the conidia are formed solitarily on the conidiogenous loci (Ellis 1971), while *Porosynnema* has indeterminate synnemata and the conidia are blastocatenate formed on the conidiogenous loci.

Several other genera, including *Exosporium* Link, *Corynespora* Güssow, *Neopodoconis* Rifai and *Ellismarsporium* R. F. Castañeda & X.G. Zhang are also compared with *Porosynnema* (Link 1809, Güssow 1905, Rifai 2008, Castañeda-Ruiz & al. 2017). These genera have tretic conidiogenesis and similar conidial morphology, but *Porosynnema* has a synnematus conidiomata, which is not found in *Exosporium*, *Corynespora* and *Ellismarsporium*. In addition, *Corynespora* differs by its monotretic conidiogenous cells, and *Exosporium* and *Neopodoconis* differ by their conidiogenous cells with dark and prominent scar at the conidiogenous loci (Ellis 1971, Rifai 2008). *Corynesporella* Munjal & H.S. Gill, characterized by mononematous, branched conidiophores, and monotretic conidiogenous cells which produce solitary or blastocatenate, distoseptate conidia, is superficially similar to *Porosynnema* (Munjal & Gill 1961). *Porosynnema* shares some characters with *Poroisariopsis* M. Morelet, such as synnematus conidiomata, polytretic conidiogenous cells, and distoseptate conidia, but in *Poroisariopsis* the conidia are solitary (Morelet 1971, Heredia & al. 2020).

Key to *Porosynnema* and morphologically similar genera

1. Conidiophores mononematous	2
1. Conidiophores synnematos	6
2. Conidiogenous cells monotretic	3
2. Conidiogenous cells polytretic	4
3. Conidiophores unbranched	<i>Corynespora</i>
3. Conidiophores branched	<i>Corynesporella</i>
4. Conidia euseptate	<i>Neopodoconis</i>
4. Conidia distoseptate	5
5. Conidiogenous cells cicatrized, with dark and prominent scars; conidia usually solitary, shortly catenate in one species	<i>Exosporium</i>
5. Conidiogenous cells non-cicatrized; conidia blastocatenate	<i>Ellismarsporium</i>
6. Conidiogenous cells monotretic	7
6. Conidiogenous cells polytretic	9
7. Conidia distoseptate	<i>Podosporiopsis</i>
7. Conidia euseptate	8
8. Conidia catenate	<i>Vamsapriya</i>
8. Conidia solitary	<i>Podosporium</i>
9. Conidia catenate, distoseptate, conidiogenous cells cicatrized	<i>Porosynnema</i>
9. Conidia solitary	10
10. Synnemata indeterminate, conidiogenous cells with cylindrical, uncinata to sigmoid, enteroblastic, percurrent extensions	<i>Poroisariopsis</i>
10. Synnemata determinate, conidiogenous cells not as above	<i>Dendrographium</i>

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